

REMARKS

The Final Office Action mailed March 23, 2009 considered claims 1-9, 11, 36-38 and 50-63. Claims 1-3, 5, 7-11, and 36-38 and 61-63 were rejected under 35 U.S.C. 103(a) as being unpatentable over Zondervan et al. (US 6,516,327) hereinafter *Zondervan*, in view of Jim Challenger, et al., "A scalable system for Consistently Caching Dynamic Web Data" (hereinafter *Challenger*, and further in view of Craig et al. (US 6,757,708) hereinafter *Craig*. Claims 4, and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Zondervan* in view of *Challenger*, and in view of *Craig*, and further in view of Dettinger et al. (US 2003/0093413) hereinafter *Dettinger*. Claims 50-59 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Zondervan* in view of *Challenger*, and in view of *Craig*, and further in view of Shaul Dar, et al., "Semantic Data Chacing and Replacement" hereinafter *Dar et al.*. Claim 60 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Zondervan* in view of *Challenger*, and further in view of *Craig*, and further in view of Jacobs et al. (US 6,732,237) hereinafter *Jacobs*.¹

By this paper, claims 1, 36, 51, 54, 56, 59 and 60 are amended,² and claims 50, 53, 55 and 58 are cancelled without prejudice. Accordingly, claims 1-9, 11, 36-38, 51-52, 54, 56-57 and 59-63 are pending, of which claims 1 (directed to a method), 36 (directed to a corresponding computer program product) and 60 (directed to a method) are the independent claims at issue.

Independent claims 1 and 36 and depending claims 2-3, 5, 7-11 and 37-38 were rejected by the Office Action under §103(a) as being unpatentable over *Zondervan* in view of *Challenger*, and further in view of *Craig*. Further, depending claims 4 and 6 were rejected by the Office Action under §103(a) as being unpatentable over *Zondervan*, *Challenger*, and *Craig*, and further in view of *Dettinger*. Additionally, depending claims 50-59 were rejected by the Office Action under §103(a) as being unpatentable over *Zondervan*, *Challenger*, and *Craig*, further in view of *Dar*.

The amendments to independent claims 1 (directed to a method) and 36 (directed to a corresponding computer program product) clarify an embodiment of the invention for formulating and caching a Web based response in response to receiving a Web based request for

¹ Although the prior art status of the cited art is not being challenged at this time, Applicant reserves the right to challenge the prior art status of the cited art at any appropriate time, should it arise. Accordingly, any arguments and amendments made herein should not be construed as acquiescing to any prior art status of the cited art.

² Support for the amendments to the claims are found throughout the specification, Figures, and previously presented claims, including, paragraphs [0052]-[0053], [0088], [0092] and [0102], and Figure 1.

database content. A data table is selected that is to be monitored for content changes. In addition, a record for the selected data table is inserted into a separate change notification table. The record includes versioning information identifying and corresponding to the selected data table. Furthermore, a trigger is assigned to the selected data table. The trigger is configured to update the versioning information for the selected table in the change notification table when content in the selected data table is altered.

Interim results (based on one or more records from the selected data table) are cached in a cache entry in a cache. The cache entry is made dependent on the selected data table by including the versioning information in the cache entry. A Web based request for a Web based response is received, which is to include the interim results. The web based request corresponds to a page file which includes scripts to be executed to determine the Web based response.

The change notification table is queried for versioning information identifying and corresponding to the selected data table, and the current versioning information is received. The cached versioning information is compared to the current versioning information. Based on the results of this comparison, it is determined how to access the interim results for inclusion in a Web based response. This determination includes determining that the interim results are to be reconstructed from the one or more records in the selected data table and records in other data tables.

The interim results are accessed in accordance with the determination. This access includes reconstructing the interim results from the one or more records in the selected data table and the records in the other data tables notwithstanding that interim results were cached when the Web based request was received. Commands included in the scripts in the page file are executed to construct a Web based response responsive to the Web based request based on the interim results. Based on the commands executed during the construction of the Web based response, a database cache dependency is assigned to at least a portion of the constructed Web based response. The executed commands define at least one database and at least one table on which the database cache entry is dependent, and further define the portion of the constructed Web based response on which the cache dependency is dependent. In addition, at least a portion of the constructed Web based response is cached in a cache entry in the cache.

Applicants respectfully submit that the cited art of record does not anticipate or otherwise render the amended claims unpatentable for at least the reason that that cited art does not disclose, suggest, or enable each and every element of these claims.

Zondervan generally describes a system and method for synchronizing data in multiple databases. The system in *Zondervan* may comprise a source system and a secondary system including a source database in a distributed database system which is synchronized to a secondary database. (col. 2, ll. 37-42). In addition, *Zondervan* may contain a mapping identification table, a delta table, replica databases, and a replica identification table. (col. 2, ll. 47-62). *Zondervan* includes a method which generally synchronizes data between the source database and the secondary database using these other databases and structures. However, *Zondervan* fails to teach or suggest "an act of determining that the interim results are to be reconstructed from the one or more records in the selected data table and one or more records in one or more other data tables" and "act of reconstructing the interim results from one or more records in the selected data table and the one or more records in the one or more other data tables not withstanding that interim results were cached at the computer system when the Web based request was received," among other limitations recited by claims 1 and 36.

The other cited art also fails to overcome the deficiencies of *Zondervan*. For example, *Challenger* and *Craig* generally disclose methods for caching web data, but fail to teach or suggest these limitations.

Dar was previously cited for similar teachings, but *Dar* fails to teach or suggest the above-recited limitations, and further, *Dar* teaches away from the claimed limitations. For example, *Dar* is generally directed to client-side caching and replacement in a client-server database system. (Abstract). Goals include utilizing computational and storage resources on client machines and reducing interaction with server machines. (Section 1.1, first paragraph). Accordingly, caches are stores at client machines, and queries are posed at a client machines, split by the client machines, and possibly submitted to a server machine. (Section 2.4, paragraph 3). By contrast, the claimed limitations occur in a "computer system configured to provide content . . . to a web server." Accordingly, the architecture in which the claimed embodiments occur is different than that of *Dar*. Further, *Dar* teaches fixed-length pages containing multiple fixed-length tuples. (Section 2.1, first paragraph). By contrast, the claimed limitations include "cache [entries] for Web based content," which are, by the nature of Web based content, not

fixed length. Accordingly, the pages are tuples of *Dar* are not applicable to the claimed embodiments. For at least these reasons, Applicants respectfully submit that fails to overcome the deficiencies of *Zondervan*, *Challenger*, and *Craig*.

Accordingly, the cited art fails to teach or suggest either singly or in combination:

“an act of determining how to access the interim results for inclusion in a Web based response based on the results of comparing the versioning information and in response to receiving the Web based request for the portion of content, the act comprising an act of determining that the interim results are to be reconstructed from the one or more records in the selected data table and one or more records in one or more other data tables;

an act of accessing the interim results in accordance with the determination, the act comprising an act of reconstructing the interim results from one or more records in the selected data table and the one or more records in the one or more other data tables not withstanding that interim results were cached at the computer system when the Web based request was received;”

as recited by claim 1, wherein in combination with the other limitations of claim 1. At least for this reason claim 1 patentably defines over the art of record. At least for this same reason claim 36 patentably defines over the art of record.³ Each of dependent claims 2-9, 11, 37-38, 51-52, 54, 56-57, 59 and 61-63 also patentably define over the art of record for at least that same reason as claim 1. However, a number of the dependent claims also individually distinguish over the art of record.

Independent claim 60 (directed to a method) was rejected by the Office Action under §103(a) as being unpatentable over *Zondervan*, *Challenger*, and *Craig*, and further in view of *Jacobs*.

The amendments to independent claim 60 (directed to a method) recite an embodiment of the invention for updating a database dependent cache entry and invalidating a key dependent cache entry that has a key dependency on the database dependent cache entry when changes are

³ Claims 1 and 39 also patentably define over the art of record for other reasons, such as, for example, “the web based request corresponding to a page file which includes one or more scripts to be executed to determine the Web based response.”

detected in a data table. A data table is selected (from among one or more data tables of a database) that is to be monitored for content changes. A record for the selected data table is inserted into a separate change notification table. The record includes versioning information identifying and corresponding to the selected data table. A trigger is attached to the selected data table. The trigger is configured to update the versioning information for the selected table in the change notification table when any record in the selected data table is altered regardless of the mechanism used to alter the record.

First interim results are constructed from a collection of records, including a plurality of records in the selected data table and one or more records from one or more other data tables. In addition, second interim results are constructed from a collection of records, including a plurality of records in the selected data table and one or more records from one or more other data tables. The second interim results are dependent on the first interim results.

The first interim results are cached in a database dependent cache entry in a cache. The database dependent cache entry includes the versioning information (described above). The second interim results are cached in a key dependent cache entry in the cache. The key dependent cache entry includes a key dependency to the database dependent cache entry. The key dependency indicates that the key dependent cache entry should be invalidated by the database dependent cache entry when a change to a record in the selected data table is detected.

A cache interface module issues a blocking querying to the change notification table for versioning information identifying and corresponding to the selected data table. The blocking query waits until versioning information for the selected table is updated before returning the versioning information for the selected data table. Subsequent to issuing the blocking query, a change to a record in the selected data table is detected. Also subsequent to issuing the blocking query, the assigned trigger updates the versioning information for the selected table in the change notification table.

In response to the blocking query, the cache interface module receives the updated versioning information. The cached versioning information in the database dependent cache entry is compared to the updated versioning information. Based on the results of the comparison, the database dependent cache entry invalidates the key dependent cache entry (for the second interim results), and the cached versioning information in the database dependent cache entry (for the first interim results) is updated with the updated versioning information.

Applicants respectfully submit that the cited art of record does not anticipate or otherwise render the amended claims unpatentable for at least the reason that that cited art does not disclose, suggest, or enable each and every element of this claim.

For example, *Zondervan*, *Challenger*, and *Craig* fail to teach or suggest either singly or in combination "constructing first interim results," "constructing second interim results . . . the second interim results . . . dependent on the first interim results," "caching the first interim results . . . including the versioning information," "caching the second interim results in a second cache entry in the cache . . . including a key dependency to the first cache entry," "the first cache entry invalidating the second cache entry," and "updating the cached versioning information in the first cache entry."

The other cited art also fails to overcome the deficiencies of *Zondervan*, *Challenger*, and *Craig*. For example, *Jacobs* generally discloses a multi-tier caching system, but fails to teach or suggest these limitations.

Accordingly, the cited art fails to teach or suggest either singly or in combination:

 "an act of constructing first interim results from a collection of records, including a plurality of records in the selected data table and one or more records from one or more other data tables, the first interim results usable in the generation of a plurality of different Web based responses;

 an act of constructing second interim results from a collection of records, including a plurality of records in the selected data table and one or more records from one or more other data tables, the second interim results usable in the generation of a plurality of different Web based responses and dependent on the first interim results;

 an act of caching the first interim results in a database dependent cache entry in the cache, the database dependent cache entry including the versioning information identifying and corresponding to the selected data table;

 an act of caching the second interim results in a key dependent cache entry in the cache, the key dependent cache entry including a key dependency to the database dependent cache entry, the key dependency indicating that the key dependent cache entry should be invalidated by the database dependent cache entry when a change to a record in the selected data table is detected;

...

based on the results of the comparison:

an act of the database dependent cache entry invalidating the key dependent cache entry for the second interim results; and

an act of updating the cached versioning information in the database dependent cache entry for the first interim results with the updated versioning information.”

as recited in claim 60, wherein in combination with the other limitations of claim 60. At least for this reason claim 60 patentably defines over the art of record.

In view of the foregoing, Applicant respectfully submits that the other rejections to the claims are now moot and do not, therefore, need to be addressed individually at this time. It will be appreciated, however, that this should not be construed as Applicant acquiescing to any of the purported teachings or assertions made in the last action regarding the cited art or the pending application, including any official notice. Instead, Applicant reserves the right to challenge any of the purported teachings or assertions made in the last action at any appropriate time in the future, should the need arise. Furthermore, to the extent that the Examiner has relied on any Official Notice, explicitly or implicitly, Applicant specifically requests that the Examiner provide references supporting the teachings officially noticed, as well as the required motivation or suggestion to combine the relied upon notice with the other art of record.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at 801-533-9800.

Dated this 6th day of July, 2009.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "R. Nydegger", written over the typed name.

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